Trend Study 25C-8-03

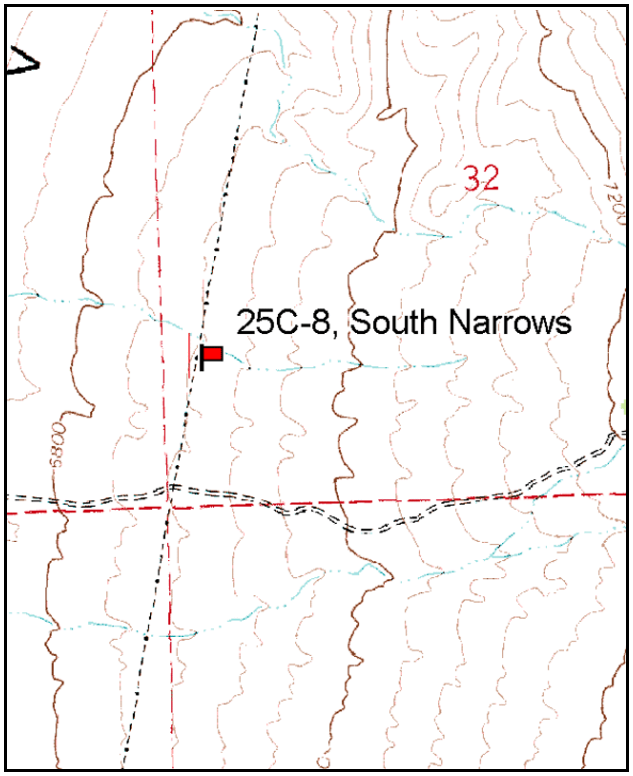
Study site name: South Narrows . Vegetation type: Big Sagebrush-Grass .

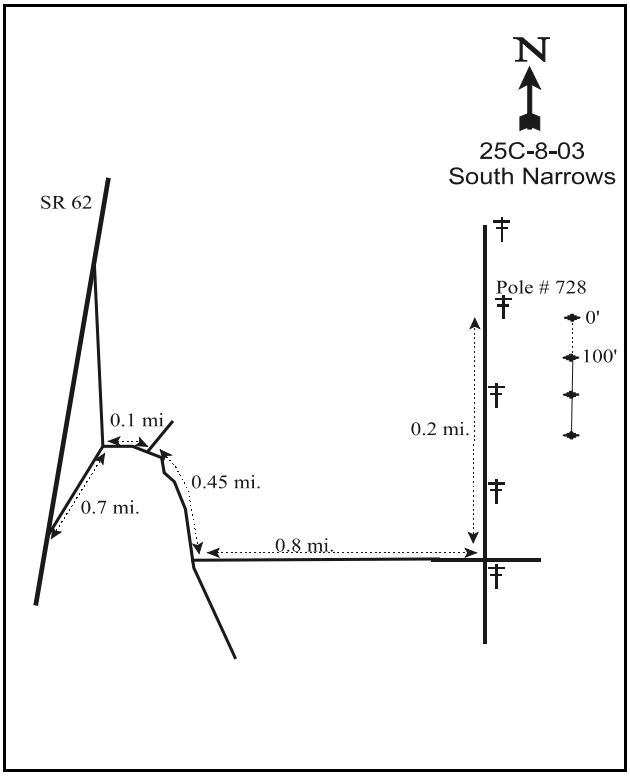
Compass bearing: frequency baseline 180 degrees magnetic.

Frequency belt placement: line 1 (11 & 71ft), line 2 (34ft & 95ft), line 3 (59ft). Rebar: belt 4 on 2ft.

LOCATION DESCRIPTION

Proceed south of Koosharem on SR62. Turn left (east) 0.5 miles south of mile marker 24. Go northeast 0.7 miles and turn right. Go east 0.1 miles to another fork and turn right. Go 0.45 miles and turn left just across the creek (Otter Creek). Go 0.8 miles east and turn left. Drive parallel to the powerline (north) for 0.2 miles to pole #728. The frequency baseline begins 100 feet east of this powerpole. The 0-foot baseline stake is tagged #7120. All stakes are rebar.





Map Name: Parker Knoll

Diagrammatic Sketch

Township 28S , Range 1W , Section 32

GPS: NAD 27, UTM 12S 4242347 N, 418231 E

DISCUSSION

South Narrows - Trend Study No. 25C-8

The South Narrows trend study is located west of Parker Mountain in Grass Valley at an elevation of 6,900 feet. The foothills slope gently west-southwest toward Otter Creek about ½ mile away. The range type is Wyoming big sagebrush-grass in association with scattered pinyon-juniper. Mule deer and elk use the area for winter range. The level of browsing and number of pellet groups indicate a low level of use with 13 deer and 14 elk days use/acre estimated in 1991 (32 ddu/ha and 35 edu/ha). Pellet group data from the site in 1998 estimated a higher level of deer use at 30 days use/acre (74 ddu/ha), but elk use was similar to 1991 at 16 days use/acre (40 edu/ha). Pellet group data from 2003 show very similar deer and elk use compared to 1998 estimates at 29 deer and 17 elk days use/acre (73 ddu/ha and 41 edu/ha). Security and thermal cover are lacking except for a few pinyon-junipers along the washes. Livestock have grazed here heavily in the past, yet use levels were estimated at only 3 cow days use/acre in 1998 and 9 days use/acre in 2003 (7 cdu/ha and 22 cdu/ha).

Soil is very rocky and relatively shallow with an effective rooting depth estimated at only 9 inches. Parent material is basalt and the dark colored rocks and pavement are common on the surface providing 41% cover in 1998 and 2003. Rock ranges in size from small gravel to large boulders, and is found throughout the soil profile. Stoniness index data show rock to be concentrated from the surface down to about 4 inches. Due to the high rock content, average soil temperature is high at nearly 70°F at an average depth of 8.5 inches in 1998. Soil texture is a sandy loam which is slightly acidic in reaction (pH 6.3). Litter cover is clustered under sagebrush plants. There is some evidence of soil movement, although erosion is not severe on the site. Two washes run through the transect area which channel water into Otter Creek during heavy runoff events.

The key species is Wyoming big sagebrush, which provides nearly all of the browse cover on the site. Density has ranged between 3,665 plants/acre in 1985 to 4,440 in 2003. Utilization has been moderate to heavy over the years with the heaviest use reported in 1985. Percent decadence has remained fairly steady averaging 35% between 1985 and 1998. Drought conditions have caused the number of decadent plants to increase to 56% in 2003. Plants displaying poor vigor was relatively high at 20% in 1991 and 31% in 2003, both drought years. An average of 42% of the decadent plants sampled between 1991 and 2003 were classified as dying but the population has remained stable due to adequate young recruitment. Young recruitment was poor in 2003 suggesting that the population may decline in the future. The only other shrubs found on the site include low numbers of broom snakeweed, winterfat, and 2 species of cactus.

As with the browse, species diversity of herbaceous plants is low. The only common perennial grasses found on the site include blue grama and needle-and-thread. These 2 species provided 97% of the grass cover in 2003. Indian ricegrass and bottlebrush squirreltail are found in small numbers. Forbs are lacking. Total forb cover has totaled less than ½ of 1% since 1994.

1985 APPARENT TREND ASSESSMENT

Soil trend appears stable. Vegetative trend also appears stable, but could be improving under reduced livestock grazing. An increase in grass density, especially needle-and-thread and Indian ricegrass, is desirable to improve early spring forage, but the rockiness of the soil may be limiting to the site potential.

1991 TREND ASSESSMENT

Soil trend would be slightly down, regardless of the changes in the rock and pavement values which negate one another. There were substantial losses in litter cover and increases in percent bare ground. There are not many browse species on this site, but the key species, Wyoming big sagebrush, has increased it's density by

26% with a slight increase in rate of decadency. This would be expected with the drought. The browse trend is considered slightly improving. The herbaceous understory is stable with a slight increase in the nested frequency of perennial grasses. One problem on this site is that there are no forbs.

TREND ASSESSMENT
soil - down slightly (2)
browse - up slightly (4)
herbaceous understory - stable but poor (3)

1994 TREND ASSESSMENT

The soil trend would be considered stable since the percent of rock-pavement cover has decreased and percent bare ground has also decreased from 23% to 16%. Litter cover has declined slightly. The browse trend is regarded as stable even with the slight decrease in the Wyoming big sagebrush population (12%). Use remains mostly light to moderate and vigor normal on most plants. Young recruitment is marginal. Trend for the herbaceous understory is up slightly. Sum of nested frequency of grasses continues to increase including a significant increase in the nested frequency of Indian ricegrass. Some forbs were picked up this year but they are still lacking with a cover value of less than 1%.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - up slightly (4)

1998 TREND ASSESSMENT

Trend for soil appears stable with an increase in litter cover and a slight increase in percent bare ground. Trend for the key Wyoming big sagebrush is slightly down with a lower density, percent decadence still above 30%, and the percentage of decadent plants classified as dying increasing to 44%. Reproduction has improved. Trend for the herbaceous understory is stable. Sum of nested frequency of grasses has increased slightly while frequency of forbs has declined. Most of the drop in frequency of forbs is the result of a lack of annual forbs in 1998 compared to 1994.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2)
herbaceous understory - stable, but still lacking forbs (3)

2003 TREND ASSESSMENT

Trend for soil is stable. Relative percent cover of vegetation, litter, and bare ground have remained similar to 1998 estimates. Trend for the key browse, Wyoming big sagebrush, is down. Even though the population has remained relatively stable since 1991, and has actually increased 12% since 1998, the sagebrush on this site is showing the effects of drought. Young recruitment is low, vigor is poor on 1/3 of the population, and percent decadence has increased to 56%. In addition, nearly half (46%) or 1,140 sagebrush per acre were rated as dying (>50% crown death). All data points to a decline in the sagebrush population in the future. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennial grasses has declined slightly (15%) but the dominant grasses, blue grama and needle-and-thread, remained stable. Nested frequency of bottlebrush squirreltail declined significantly. Total grass cover has remained nearly identical to 1998 estimates at about 13.5%. Forbs are still lacking.

TREND ASSESSMENT
soil - stable (3)
browse - down (1)
herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --
Management unit 25C, Study no: 8

Type	Species	Nested Frequency					Average Cover %		
		'85	'91	'94	'98	'03	'94	'98	'03
G	Bouteloua gracilis	284	296	289	274	266	12.30	9.30	10.01
G	Bromus tectorum (a)	-	-	$_{a}$1	$_{b}$14	$_{a}$-	.00	.06	-
G	Oryzopsis hymenoides	$_{a}$6	$_{ab}$16	$_{c}$49	$_{bc}$24	$_{ab}$8	1.80	.36	.21
G	Sitanion hystrix	$_{ab}$43	$_{b}$52	$_{b}$58	$_{b}$58	$_{a}$21	.88	.36	.12
G	Sporobolus cryptandrus	$_{a}$-	$_{a}$-	$_{b}$8	$_{a}$3	$_{a}$1	.10	.03	.03
G	Stipa comata	$_{a}$75	$_{a}$95	$_{a}$102	$_{b}$165	$_{b}$165	2.96	3.48	3.16
Total for Annual Grasses		0	0	1	14	0	0.00	0.06	0
Total for Perennial Grasses		408	459	506	524	461	18.05	13.55	13.54
Total for Grasses		408	459	507	538	461	18.05	13.61	13.54
F	Astragalus spp.	-	-	6	3	-	.04	.04	-
F	Descurainia pinnata (a)	-	-	$_{b}$20	$_{a}$2	$_{b}$16	.05	.00	.15
F	Draba spp. (a)	-	-	$_{b}$12	$_{ab}$8	$_{a}$-	.03	.01	-
F	Erigeron pumilus	$_{a}$-	$_{a}$-	$_{b}$10	$_{ab}$9	$_{a}$-	.07	.06	-
F	Lappula occidentalis (a)	-	-	$_{c}$62	$_{a}$3	$_{b}$27	.15	.01	.18
F	Lepidium spp. (a)	-	-	$_{b}$20	$_{a}$-	$_{a}$-	.05	-	-
F	Phlox hoodii	-	-	-	-	1	-	-	.00
F	Phlox longifolia	-	-	3	-	-	.00	-	-
F	Sphaeralcea coccinea	-	-	-	-	3	-	-	.00
Total for Annual Forbs		0	0	114	13	43	0.28	0.02	0.33
Total for Perennial Forbs		0	0	19	12	4	0.12	0.10	0.00
Total for Forbs		0	0	133	25	47	0.40	0.13	0.34

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 25C, Study no: 8

Type	Species	Strip Frequency			Average Cover %		
		'94	'98	'03	'94	'98	'03
B	Artemisia tridentata wyomingensis	88	84	91	11.14	10.00	14.18
B	Ceratoides lanata	0	1	1	-	-	-
B	Chrysothamnus nauseosus	0	1	0	-	-	-
B	Echinocereus spp.	0	0	0	.00	-	-
B	Gutierrezia sarothrae	0	0	1	-	-	.03
B	Juniperus osteosperma	0	1	0	.15	.03	-
B	Opuntia spp.	3	5	12	.00	.00	.36
B	Pediocactus simpsonii	0	6	2	-	.07	.01
Total for Browse		91	98	107	11.30	10.10	14.58

CANOPY COVER, LINE INTERCEPT --
Management unit 25C, Study no: 8

Species	Percent Cover '03
Artemisia tridentata wyomingensis	12.88
Opuntia spp.	.01

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 25C, Study no: 8

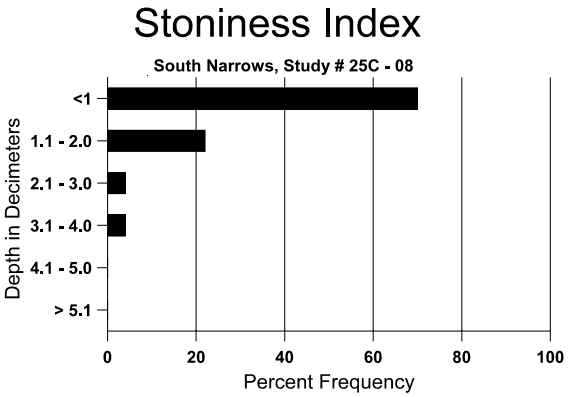
Species	Average leader growth (in) '03
Artemisia tridentata wyomingensis	1.5

BASIC COVER --
Management unit 25C, Study no: 8

Cover Type	Average Cover %				
	'85	'91	'94	'98	'03
Vegetation	11.00	13.25	27.00	27.67	28.39
Rock	17.50	25.50	25.76	25.90	25.40
Pavement	20.75	15.25	3.57	15.20	15.48
Litter	34.50	22.50	17.28	26.57	20.55
Cryptogams	2.25	.75	.33	.92	.51
Bare Ground	14.00	22.75	16.27	20.51	17.73

SOIL ANALYSIS DATA --
Management unit 25C, Study no: 8, Study Name: South Narrows

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
8.5	69.6 (9.2)	6.3	54.0	31.4	14.6	1.5	13.5	105.6	0.5



PELLET GROUP DATA --
Management unit 25C, Study no: 8

Type	Quadrat Frequency		
	'94	'98	'03
Rabbit	17	18	23
Elk	7	11	5
Deer	24	37	23
Cattle	3	1	2

Days use per acre (ha)	
'98	'03
-	-
16 (40)	17 (41)
30 (74)	29 (73)
3 (7)	9 (23)

BROWSE CHARACTERISTICS --
Management unit 25C, Study no: 8

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis											
85	**3665**	133	333	2466	866	-	67	20	24	5	12/19
91	**4932**	-	1133	1866	1933	-	47	9	39	20	15/21
94	**4340**	40	160	2660	1520	880	34	2	35	17	17/29
98	**3900**	20	540	2100	1260	840	38	10	32	14	18/30
03	**4440**	-	40	1920	2480	960	17	0	56	31	18/29

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Ceratoides lanata											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**20**	-	-	20	-	-	0	0	-	0	9/6
03	**20**	-	-	20	-	-	0	0	-	0	6/10
Chrysothamnus nauseosus											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**20**	-	-	20	-	-	100	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Gutierrezia sarothrae											
85	**0**	-	-	-	-	-	0	0	0	0	-/-
91	**0**	-	-	-	-	-	0	0	0	0	-/-
94	**0**	-	-	-	-	-	0	0	0	0	-/-
98	**0**	-	-	-	-	-	0	0	0	0	7/11
03	**20**	-	-	-	20	-	0	0	100	0	-/-
Juniperus osteosperma											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**20**	-	-	20	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Opuntia spp.											
85	**200**	-	-	200	-	-	0	0	-	0	2/2
91	**199**	-	133	66	-	-	0	0	-	0	2/4
94	**60**	20	-	60	-	-	0	0	-	0	2/3
98	**100**	-	40	60	-	-	0	0	-	0	4/6
03	**260**	-	-	260	-	-	0	0	-	8	4/10
Pediocactus simpsonii											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**140**	20	40	100	-	-	0	0	-	0	1/2
03	**40**	-	-	40	-	-	0	0	-	0	2/3

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Pinus edulis											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	20	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Tetradymia canescens											
85	**533**	-	-	533	-	-	0	0	-	0	9/4
91	**333**	-	-	333	-	-	40	20	-	0	6/4
94	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-